

REMARKS / ARGUMENTS

The present application includes pending claims 1-17, all of which have been rejected. By this Amendment, claims 2-12 and 14-17 have been amended, as set forth above, to further clarify the language used in these claims and to further prosecution of the present application, and new claims 18-23 have been added. The Applicant respectfully submits that all the claims define patentable subject matter.

Claims 1-4 and 7-10 were rejected under 35 U.S.C. 102(e) as being anticipated by Chien U.S. Pub No 2004/0203472 A1 ("Chien"). Claims 5-6 and 11-17 were rejected under 35 U.S.C. 103(a) as being unpatentable over Chien in view of U.S. Pub No 2003/0206603 A1 ("Husted"). The Applicant respectfully traverses these rejections at least based on the following remarks:

REJECTION UNDER 35 U.S.C. § 102

I. Chien Does Not Anticipate Claims 1-4 and 7-10

The Applicant first turns to the rejection of claims 1-4 and 7-10 under 35 U.S.C. 102(e) as being anticipated by Chien. With regard to the anticipation rejections under 102(e), MPEP 2131 states that "[a] claim is anticipated only if **each and every element** as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." See Manual of Patent

Examining Procedure (MPEP) at 2131 (internal citation omitted) (emphasis added). Furthermore, "[t]he identical invention must be shown in as complete detail as is contained in the ... claim." See *id.* (internal citation omitted).

Chien discloses "a transceiver includ[ing] a switching unit configurable for isolating an input of a receiver from an output of a transmitter during a local calibration mode." See Chien at Abstract. More specifically, Chien discloses a "receiver compensation factor estimation unit" and a "transmitter compensation factor unit." See Chien at paragraph [0022].

A. Rejection of Independent Claims 1 and 7 under 35 U.S.C. § 102 (e)

With regard to the rejection of independent claim 1 under Chien, the Applicant submits that Chien does not disclose or suggest at least the limitation of "estimating a transmitter IQ mismatch in a form of gain and phase response," as recited by the Applicant in independent claim 1.

The Office Action states the following:

As per claims 1 and 7, Chien teaches a method for measuring IQ path mismatch in transceivers, the method comprising: estimating a transmitter IQ mismatch in a form of gain and phase response for transmitter I and Q paths sharing a receiver path (see figs. 6 and 7 and page 2 [0015, 0017 and 0022]); and estimating a receiver IQ mismatch in a form of gain and phase response for receiver I and Q paths sharing a signal source (see figs. 6 and 7 and page 2 [0014, 0017, and 0022]).

See Office Action at page 2. The Office Action refers for support to figs. 6 and 7 and paragraphs [0014], [0015], [0017] and [0022] of Chien.

Paragraph [0022] of Chien reads as follows:

The system further comprises at least one receiver compensation factor estimation unit coupled to an output of the quadrature demodulator for estimating, after conversion of the known signal into in-phase and quadrature phase signals, at least one receiver compensation factor for compensating the receiver section for an imbalance in subsequently received in-phase and quadrature phase signals. **Embodiments of the present invention may further comprise at least one transmitter compensation factor estimation unit for estimating at least one transmitter compensation factor for compensating the transmitter section for an imbalance in-phase and quadrature phase signals.**

See Chien at paragraph [0022] (emphasis added). As it may be seen from the above citation, Chien utilizes a transmitter compensation factor estimation unit to perform estimation of a transmitter compensation factor. Chien does not perform estimation of an IQ mismatch. In fact, Chien also does not disclose determining a gain and phase response. Consequently, Chien does not perform "estimating a transmitter IQ mismatch in a form of gain and phase response" or "estimating a receiver IQ mismatch in a form of gain and phase response" as recited by the Applicant in claim 1.

With regard to the additional citations referred to in the Office Action, the Applicant has read paragraphs [0014], [0015], and [0017], as well as the

remainder of Chien, and has been unable to identify where Chien discloses at least the aforementioned limitation from Applicant's claim 1. For example, paragraph [0014] states known formulae and nomenclature as background information for the reader. Similarly, paragraph [0015] states a typical use of a quadrature modulator at the transmitter. Finally, paragraph [0017] states conventions for subscript notations to be used for various equations.

Therefore, the Applicant maintains that Chien does not disclose or suggest at least the limitation of "estimating a transmitter IQ mismatch in a form of gain and phase response" or "estimating a receiver IQ mismatch in a form of gain and phase response" as recited by the Applicant in independent claim 1.

Accordingly, independent claim 1 is not anticipated by Chien and is allowable. Independent claim 7 is similar in many respects to the method disclosed in independent claim 1. Therefore, the Applicant submits that independent claim 7 is also allowable over the references cited in the Office Action at least for the reasons stated above with regard to claim 1.

B. Rejection of Dependent Claims 2-4 and 8-10

Based on at least the foregoing, the Applicant believes the rejection of independent claims 1 and 7 under 35 U.S.C. 102(e) as being anticipated by Chien has been overcome and requests that the rejection be withdrawn. Additionally, claims 2-4 and 8-10 depend from independent claims 1 and 7, respectively, and

are, consequently, also respectfully submitted to be allowable at least for the reasons stated above.

Applicant also reserves the right to argue additional reasons beyond those set forth above to support the allowability of claims 2-4 and 8-10.

REJECTION UNDER 35 U.S.C. § 103

In order for a *prima facie* case of obviousness to be established, the Manual of Patent Examining Procedure ("MPEP") states the following:

First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine the teaching. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest **all** the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure.

See MPEP at § 2142, citing *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991) (emphasis added). Further, MPEP § 2143.01 states that "the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art suggests the desirability of the combination," and that "although a prior art device 'may be capable of being modified to run the way the apparatus is claimed, there must be a *suggestion or motivation in the reference* to do so'" (citing *In re Mills*, 916 F.2d 680, 16 USPQ 2d 1430 (Fed. Cir. 1990)).

Moreover, MPEP § 2143.01 also states that the level of ordinary skill in the art cannot be relied upon to provide the suggestion...,” citing *AI-Site Corp. v. VSI Int'l Inc.*, 174 F.3d 1308, 50 USPQ 2d 1161 (Fed. Cir. 1999). Additionally, if a *prima facie* case of obviousness is not established, the Applicant is under no obligation to submit evidence of nonobviousness.

The examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness. If the examiner does not produce a *prima facie* case, the applicant is under no obligation to submit evidence of nonobviousness.

See MPEP at § 2142.

II. The Proposed Combination of Chien and Husted Does Not Render Claims 5-6 and 11-17 Unpatentable

The Applicant now turns to the rejection of claims 5-6 and 11-17 as being unpatentable over Chien in view of Husted.

A. The Proposed Combination Does Not Teach or Suggest “measuring a difference in the gain and phase response.”

With regard to the rejection of independent claim 13, the Applicant submits that the combination of Chien and Husted does not disclose or suggest at least the element of “measuring a difference in the gain and phase response between transmitter I and Q paths and between receiver I and Q paths of a transceiver,” as recited by the Applicant in independent claim 13.

With regard to claim 13, the Office Action states the following:

As per claim 13, Chein teaches method for estimating IQ path mismatch in a transceiver, the method comprising: measuring a difference in the gain and phase response between transmitter I and Q paths and between receiver I and Q paths of a transceiver (see page 7 [0098]), the transmitter I and Q paths sharing a receiver path and the receiver I and Q paths sharing a signal source (see figs. 6 and 7 and page 2 [0015, 0017 and 0022]).

However Chein does not teach compensating for the difference of the transmitter and receiver I and Q paths using a digital FIR filter.

Husted teaches compensating for the difference of the transmitter and receiver I and Q paths using a digital FIR filter (see page 5 [0040] and page 7 [0059]).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Husted into Chein as to remove any residual adjacent or aliased blockers before sending the data to the passive IQ calibration processing as taught by Husted (see page 5 [0040]).

See Office Action at page 13.

The Examiner refers for support to Chien at [0098], which states the following in relevant portions:

After the controller 768 sets a particular gain setting, it may issue an enable signal to the transmit modem processor 742 and symbol mapping block 739 to generate a test signal. It then may **generate a delayed enable signal to the receiver compensation factor estimator 726 to initiate the process for estimating the compensation factors based on the transmitted test signal**. The delay may be used to postpone the estimation until the test signal becomes available at the output of ADCs 722, 724. Once the estimated compensation factors are computed, the controller 768 writes the estimated factors into compensation memories 730 and 774 with an appropriate address. The process may then be repeated for different test signals at different frequencies and gain values for I-Q imbalances at both

the transmitter and receiver.
See Chien at [0098] (emphasis added).

As it may be seen from the above citation, Chien generates a delayed enable signal to the receiver compensation factor estimator (726) in order to start the process of estimating the compensation factors. Furthermore, the estimation of the compensation factor is based on the transmitted signal. Chien, including paragraph [0098], simply does not utilize gain and phase responses for purposes of measuring and compensating a difference, as it relates to IQ path mismatch. The Applicant points out that Chien does not disclose or suggest "measuring a difference in gain and phase response between transmitter I and Q paths and between receiver I and Q paths" as recited by the Applicant in claim 13.

The Examiner also relies on Husted. Husted discloses "systems and methods for passively calibrating and correcting for I/Q mismatch in a quadrature receiver without the necessity of modifying the analog portion of the receiver by adding calibration signals or correction circuitry are presented. The passive I/Q mismatch calibration system proceeds using normally received incoming transmitted data signals to obtain statistical information on which to base I/Q mismatch compensation factors." See Husted at Abstract. Furthermore, **Husted discloses a passive I/Q mismatch calibration system which uses normally received incoming transmitted data signals in order to obtain statistical information on which to base the compensation factors.** In this regard, Husted does not disclose or suggest "measuring a difference in the gain and

phase response between transmitter I and Q paths and between receiver I and Q paths of a transceiver,” as recited by the Applicant in claim 13.

In sum, the Applicant maintains that the combination of Chien and Husted does not disclose or suggest “measuring a difference in the gain and phase response between transmitter I and Q paths and between receiver I and Q paths of a transceiver” as recited by the Applicant in claim 13.

Accordingly, the proposed combination of Chien and Husted does not render independent claim 13 unpatentable, and a *prima facie* case of obviousness has not been established. The Applicant submits that claim 13 is allowable.

B. Rejection of Dependent Claims 14-17

Based on at least the foregoing, the Applicant believes the rejection of independent claim 13 under 35 U.S.C. 103(a) as being anticipated by Chien in view of Husted has been overcome and requests that the rejection be withdrawn. Additionally, claims 14-17 depend from independent claim 13, and are, consequently, also respectfully submitted to be allowable.

The Applicant also reserves the right to argue additional reasons beyond those set forth above to support the allowability of claims 14-17.

C. Rejection of Dependent Claims 5-6 and 11-12

Based on at least the foregoing, the Applicant believes the rejection of

independent claims 1 and 7 under 35 U.S.C. 102(e) as being anticipated by Chien has been overcome and requests that the rejection be withdrawn. Additionally, claims 5-6 depend from independent claim 1 and claims 11-12 depend from independent claim 7. Applicant has, in this response, established the allowability of both claims 1 and 7 over Chien. Furthermore, Husted does not overcome the deficiency of Chien as it relates to dependent claims 5-6 and 11-12. Therefore, the Applicant respectfully submits that dependent claims 5-6 and 11-12 are allowable over the references cited in the Office Action at least for the reasons stated above with regard to claims 1 and 7.

III. New Claims 18-23

The Applicant has submitted new claims 18-23, which are similar in many respects to claims 7-12, and believes that new claims are allowable for at least the same reasons discussed above supporting allowability of claims 7-12.

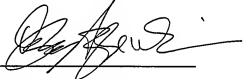
CONCLUSION

Based on at least the foregoing, the Applicant believes that all claims 1-23 are in condition for allowance. If the Examiner disagrees, the Applicant respectfully requests a telephone interview, and request that the Examiner telephone the undersigned Attorney at (312) 775-8176.

The Commissioner is hereby authorized to charge any additional fees or credit any overpayment to the deposit account of McAndrews, Held & Malloy, Ltd., Account No. 13-0017.

A Notice of Allowability is courteously solicited.

Respectfully submitted,



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